

Health effects of air pollution go beyond lung disease

March 6 2017, by Dory Devlin



Credit: AI-generated image ([disclaimer](#))

Since 2000, the last year the American Thoracic Society issued a statement on the effect of air pollution on lung diseases, a growing body of research reveals links between air pollutants and other illnesses, including heart disease, nervous system conditions and newborn infant outcomes such as low birthweight.

As a result, a recent policy statement by the organization of 15,000 physicians, research scientists and health care providers – released jointly with the European Respiratory Society – spotlights an expanded list of adverse health effects caused, in part, by pollution exposure.

"What's new in this statement is a broadening of the adverse effects of air pollution going beyond respiratory disease, which is consistent with a lot of research that's been done in the 16 years since our last statement," said Howard Kipen, a co-author and director of clinical research and occupational medicine at Rutgers Environmental and Occupational Health Sciences Institute.

Chief among the new findings: "The research shows there are more cases of heart-related disease that are affected by air pollution than there are of lung disease," Kipen said. Short-term exposures contribute to heart failure incidents and strokes and can trigger myocardial infarction, ventricular and atrial arrhythmias, and high blood pressure, the research review found.

Several studies also indicated a relationship between air pollution exposure and numerous biomarkers associated with heightened cardiovascular risk – including decreased heart rate variability and increased coronary artery calcification. But the authors found that no conclusion can be made yet to determine whether such changes lead to adverse health effects.

There also is an emerging body of evidence linking [outdoor air pollution](#) to type 2 diabetes. These findings are supported by other studies that show insulin resistance and elevated hemoglobin A1c, the statement reads.

In its last report, the American Thoracic Society identified infants as a susceptible group but did not address in utero exposure to [air pollutants](#).

A review of research since then reveals that when pregnant women are exposed to air pollution, there is a wide range of adverse effects on babies' health after birth and increased susceptibility to disease later in life, Kipen said. The authors found associations between air pollutant exposures and pre-term birth and low birthweight.

"Results from these studies and meta-analysis indicate that maternal exposure to air pollution is associated with increased risk of low birthweight, but there was considerable variability in risk estimates by specific gestational period," according to the report. The authors noted that "low birthweight at term and prematurity are adverse effects that are caused by maternal [air pollution exposure](#)."

Meanwhile, the link between respiratory illness and air pollution remain undisputable, the report finds. "There is convincing epidemiological evidence that both short-term and long-term exposures to air pollutants, including particulate matter, ozone, black carbon and nitrogen oxides are associated with increases in respiratory mortality," it reads, while particulate matter exposure increases the risk of lung cancer.

A link between exposure to air pollutants and neurodegenerative disorders, including dementia, as well as psychiatric disorders and other mental health issues also surfaced, but Kipen said the findings are not conclusive and more research is needed.

The research review proves the list of detectible air pollution health effects continues to expand, making it more important to determine the adversity of these many effects.

The report also offers a framework of considerations for assessing when air pollutants are truly linked to adverse health outcomes, and also how to assess the adversity of various different types of health outcomes.

More information: erj.ersjournals.com/content/49/1/1600419.long

Provided by Rutgers University

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